

## **REMARKS**

Reconsideration of the above-identified Application is respectfully requested. Claims 1 and 3-24 are in the case. Claim 2 has been canceled. Claims 1 and 3-5 have been amended.

Regarding the rejection of Claims 1-5, 7-10, 11-21 and 24 under 35 U.S.C. § 102(b) as allegedly being anticipated by Lenk, this rejection is traversed in part, with Claim 2 having been canceled thereby rendering the rejection moot with respect thereto, and with Claims 1 and 3-5 having been amended to overcome the rejection with respect to Claims 1, 3-5 and 7-10, as well as Claim 11 if it is, in fact, included in this rejection. Applicants note in connection with Claims 1 and 3-11 that, as a basic matter, it appears that this part of the rejection is premised in part on the equating of Lenk's output capacitor 24 with the recited "power source". Applicants surmise that such is the case because, while it is clear that Lenk's capacitor is not a power source in the well understood sense, as is, for example, a battery, nonetheless after it stores charge provided by a circuit it may then return that charge to the circuit and thus during that time of returning charge arguably have the term "power source" read on it. Indeed, during the recirculation stage of embodiments of the present invention charge is re-stored in the power source for subsequent use. Accordingly, Claim 1 has been amended to clarify that the recited power source supplies DC power *for conversion by the converter by reducing the voltage thereof*. This clearly distinguishes the recited power source from Lenk's output capacitor, since the function of Lenk's output capacitor is to filter the output voltage of his converter in well known manner, not to supply DC power for conversion.

Further, Claim 1 has been amended such that it now additionally recites a *re-circulation switch that re-circulates inductor current to the power source during non-duty cycle periods*. For example, in the embodiment shown in Figure 5 of the instant application, the fifth switch 516 may be closed (along with the fourth switch 514) so as to permit inductor current and/or ground current to re-circulate

to the power source 502 (e.g., a battery), which can, in some instances, store this power and thus conserve overall power consumption. This is neither shown nor suggested in Lenk, nor, indeed, in any of the art of record. Therefore, for the above reasons it is respectfully submitted that Claim 1 is allowable over all of the art of record. Claims 3-5 and 7-11 all depend, either directly or indirectly, from Claim 1 and so are allowable as well for the same reasons, as well as for the additional limitations found therein.

Regarding Claim 12, this claim recites a single-inductor dual-output buck converter including a power source having a positive terminal and a negative terminal, wherein the negative terminal is connected to ground; a first switch having a first terminal and a second terminal, wherein the first terminal is connected to the positive terminal of the power source; an inductor having a first terminal and a second terminal, wherein the first terminal is connected to the second terminal of the first switch; a second switch having a first terminal and a second terminal, wherein the first terminal is connected to the second terminal of the inductor; a third switch having a first terminal and a second terminal, wherein the first terminal is connected to the second terminal of the inductor; a first output connected to ground and the second terminal of the second switch; and a second output connected to ground and the second terminal of the third switch.

It was alleged that this combination is found in Lenk. Applicants respectfully dispute this allegation. Even assuming that Lenk's output capacitor 24 may be regarded as a "power source", an attempted reading of the elements of Claim 12 on Lenk's circuit, as shown in his Figure 1, fails. For example, Claim 12 recites a first output connected to ground and the second terminal of the second switch. In such a reading, the second switch is either switch 14 or switch 16. Therefore, the second terminal of the second switch is either input 12, which is obviously not an output, or ground, again, obviously not an output, especially since the recited limitation is for a first output connected to ground *and* the second terminal of the second switch. The output is connected to the second terminal of the second switch and to ground so as to allow, by the provision of

ground, a return path for the power so provided by the second terminal of the second switch. An output that is simply ground makes no sense, as there is no return path terminal. The other art of record is even less relevant.

Therefore, for the above reasons it is respectfully submitted that Claim 12 is allowable over Lenk and, indeed, all of the art of record. Claims 13-16 all depend, either directly or indirectly, from Claim 12 and so are allowable as well for the same reasons, as well as for the additional limitations found therein.

Regarding Claim 17, this claim recites a method of operating a single-inductor dual-output buck converter including the steps of entering a first stage of operation that provides power from a battery through an inductor to a first output for a first period of time; entering a second stage of operation that re-circulates inductor current to at least partially recharge the battery for a second period of time; entering a third stage of operation that provides power from the battery through the inductor to a second output for a third period of time; and entering a fourth stage of operation that re-circulates inductor current to at least partially recharge the battery for a fourth period of time. As discussed above, Lenk does not teach or suggest re-circulating inductor current to recharge a battery. Lenk's current circulation is the conventional current circulation of buck converters through the inductor in their respective phases, not through a battery that is providing power to the converter. The other art of record is even less relevant.

Therefore, for the above reasons it is respectfully submitted that Claim 17 is allowable over Lenk and, indeed, all of the art of record. Claims 18-21 and 24 all depend, either directly or indirectly, from Claim 17 and so are allowable as well for the same reasons, as well as for the additional limitations found therein.

Wherefore reconsideration and withdrawal of this rejection are respectfully requested.

Regarding the rejection of Claim 6 under 35 U.S.C. § 103(a) as allegedly being unpatentable over Lenk in view of Yang, as discussed above Claim 1 has been amended to overcome the rejection with respect to Lenk, and Claim 6 depends from Claim 1. The patent to Yang fails to cure the deficiencies of Lenk

with respect to Claim 1 as presently constituted, having been cited merely for the assertion that it is known to use a battery as a power source. The other art of record is even less relevant. Therefore, for the above reasons it is respectfully submitted that Claim 1 is allowable over Lenk, Yang, and, indeed, all of the art of record. Claim 6 depends from Claim 1 and so is allowable as well for the same reasons, as well as for the additional limitations found therein. Wherefore reconsideration and withdrawal of this rejection are respectfully requested.

Regarding the rejection of Claims 11, 22 and 23 under 35 U.S.C. § 103(a) as allegedly being unpatentable over Lenk, Claim 11 depends from Claim 1 and Claims 22 and 23 both depend indirectly from Claim 17. The reasons for the allowability of Claim 1, as presently constituted, and Claim 17 over Lenk are set forth above. Therefore, for the above reasons it is respectfully submitted that Claims 1 and 17 are allowable over Lenk, and, indeed, all of the art of record. Claim 11 depends from Claim 1 and Claims 22 and 23 both depend indirectly from Claim 17 and so these dependent claims are all allowable as well for the same reasons, as well as for the additional limitations found therein. Wherefore reconsideration and withdrawal of this rejection are respectfully requested.

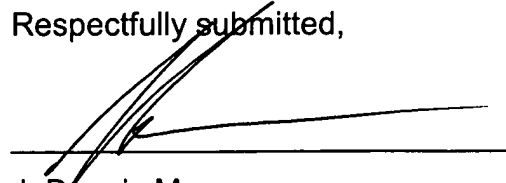
It is respectfully submitted that the claims recite the patentably distinguishing features of the invention and that, taken together with the above remarks, the present application is now in proper form for allowance. Reconsideration of the application, as amended, and allowance of the claims are requested at an early date.

While it is believed that the instant amendment places the application in condition for allowance, should the Examiner have any further comments or suggestions, it is respectfully requested that the Examiner contact the undersigned in order to expeditiously resolve any outstanding issues.

To the extent necessary, the Applicants petition for an Extension of Time under 37 C.F.R. §1.136. Please charge any fees in connection with the filing of this paper, including extension of time fees to the Deposit Account No. 20-0668

of Texas Instruments Incorporated.

Respectfully submitted,



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